

July 30 and October 1, which is of interest in determining his status as an intermittent shedder. Widal reactions have been positive in higher dilutions than would usually be expected in a carrier. This, however, may be explained on the basis of an anamnestic reaction.

Index of suspicion.—In the southern Alameda County outbreak, twenty-one reported cases of typhoid fever occurred with dates of onset between May 20 and July 17. Twenty-one cases had onsets between July 3 and July 17. Eighteen of this latter group lived within a radius of ten miles. The symptoms were only moderately severe in many patients, although of sufficient intensity to hospitalize ten persons. The dramatic decline of typhoid fever as a major cause of illness in the last fifty years has made the infection difficult to diagnose usually because it is not suspected.

Phage typing of Eberthella typhi.—Phage typing has received considerable discussion in recent literature.^{1,2} Specific types A, C, E, F, J, L, and M of *E. typhi* are now recognized. Typing procedures were begun by the Division of Laboratories, State Department of Public Health, in July, 1943, and are now routine. Through June, 1945, six hundred and four blood, stool, and urine cultures, from three hundred and twenty-six individuals, positive for *E. typhi*, have been phage typed. Such a laboratory device lends itself admirably to the study of an outbreak of typhoid fever in the field, as was amply demonstrated in the 1944 epidemic (type C), in which the source of infection of eighty-four cases was traced to uncured cheese manufactured from raw milk. It was very helpful in studying the twenty-one cases discussed in this paper.

It is obvious that this procedure is of great assistance to anyone interested in studying the possible causal relationships between any two or more persons in whom *E. typhi* can be demonstrated.

FOOD HANDLERS' EXAMINATIONS

Following the typhoid fever outbreak discussed in this paper, the restaurant concerned has requested some type of routine examination of its foodhandling personnel. We believe that public health experience over the past fifty years has amply demonstrated that the usual type of infrequent medical and laboratory examination of food handlers will not prevent occurrences similar to the southern Alameda County outbreak. It is true that routine laboratory examinations of stool and urine will occasionally detect *E. typhi* in an apparently well person (food handler or otherwise), but the net effect of such a program when applied to food handlers is to give the public a false sense of security. Only a thorough history and physical examination, complete with appropriate laboratory tests repeated almost daily, could offer any reasonable guarantee against missing inapparent infections. Such a program is not feasible administratively, because of cost and lack of competent examining personnel.

The present trend in public health practice is to replace the unsatisfactory system of periodic medical and laboratory examination of food handlers with health department sponsored training courses in methods of modern restaurant sanitation. Such a course includes a discussion of habits of personal cleanliness.

CONCLUSIONS

1. Twenty-one cases of phage type E typhoid fever occurred in southern Alameda County, which were traced to contaminated cream-filled pastries. A carrier was identified.
2. The mode of infection is discussed.
3. Typhoid fever is no longer a common disease and

for this reason is occasionally misdiagnosed. It should be considered in any unexplained febrile illness.

4. Phage typing of *Eberthella typhi* is a valuable epidemiologic tool.

Room 1122, 760 Market St., San Francisco.
576 Callan Avenue, San Leandro.

REFERENCES

1. James Craigie and Chun Hui Yen, *Can. J. Pub. Hlth.*, 29:448 and 29:484, 1938.
2. Alfred S. Lazarus, *Am. J. Pub. Hlth.*, 31:60, 1941.

CORNEAL TRANSPLANTATION*

REPORT OF CASE

CLARENCE H. ALBAUGH, M.D.
Los Angeles

INTRODUCTION.—Inasmuch as the literature on this subject has been reviewed exhaustively by Castroviejo in a recent paper, a further review in this discussion would be superfluous. The essence of this presentation will be found in the colored motion picture illustrations. This paper is a case report illustrated by a motion picture in color, concerning a patient with keratoconus in which corneal transplantation was done by the Castroviejo method.

REPORT OF CASE

Mrs. L. L., a 35-year-old white housewife, was first seen on February 3, 1944, with the complaint that for the previous two weeks she had been unable to see anything but light from either eye. She gave a history of having had conical cornea for many years. She had never been able to wear a contact lens in the left eye, but had worn one in the right eye with comfort. At the time this patient was first seen, her uncorrected vision was light perception in each eye. With a contact lens, she could read 20/70 in the right eye and 20/100 in the left. In the right eye there was a very large cone with many opacities in the posterior surface and the cornea was about one-third of the normal thickness. The left eye presented a similar picture except that the stroma over the cone was quite hazy and Descemet's membrane was bulging in the center where there was a staining area about two millimeters in diameter, characteristic of a vesicular keratitis.

Immediate treatment consisted in application of a pressure bandage and atropine. Seven days later, the cone was much flatter and the eye was much less irritated. The patient was very much discouraged and felt that life was not worth living under these conditions, inasmuch as she could hardly get around her own home and was unable to take care of her children.

She was advised to have a corneal transplantation. When suitable material could be obtained, a transplant was done by the Castroviejo technique; recovery was uneventful except that there was a small anterior synechiae in the lower outer corner of the transplant. This has caused no serious damage and no vessels grew into the transplant. During the first postoperative month, 400 R units of unfiltered x-ray were given. This transplant has remained quite clear to date. Two months after surgery, the vision in this eye was 20/30. With a small cylinder and a plus 3 sphere, the vision could be improved to 20/20.

The patient was so pleased with the result that she insisted upon having the other eye done. A corneal transplant, by the same technique, was done on November 9, 1944, and the pictures to be seen are those taken at that operation. One month after operation, the vision in this eye was 20/50 plus, uncorrected, and 20/30 corrected. No vessels have grown in, and the corneal transplant has remained quite clear.

INDICATIONS FOR CORNEAL TRANSPLANTATION

Determination of the indications for corneal transplantation in cases of conical cornea is important. These may be listed as follows:

1. When the tip of the cone begins to break down

* Read before the Section on Eye, Ear, Nose and Throat, at the Seventy-fourth Annual Session of the California Medical Association, Los Angeles, May 6-7, 1945.

and a Descemetocoele is formed, then corneal transplantation becomes mandatory.

2. When a patient is unable to wear a contact lens for a practical amount of time.

3. When the tip of the cone becomes so opaque that vision is not good even with a contact lens.

The advisability of doing transplantation in the presence of one good eye is always debatable. However, in threatened rupture this is mandatory.

OPERATIVE COMPLICATIONS

Complications may be divided conveniently into those occurring in the immediate postoperative period, and those occurring in the late postoperative period.

In the first instance, namely the complications occurring in the early postoperative period, that most to be feared is incarceration or prolapse of the iris. This particular complication is very prone to occur in those cases having transplantation for conical cornea, inasmuch as a very large section of the cornea is transplanted. The iris is in very close proximity to the wound and it is easily incarcerated. This complication is a difficult one to treat, inasmuch as manipulation during the immediate postoperative period nearly always leads to a cloudy segment. It is better perhaps to leave these alone unless there is a frank prolapse, and to make a secondary repair at a later date. It is to be noted that in cases in which incarceration occurs, it is doubly necessary to use x-ray following hospitalization in order to prevent vascularization of the transplant. Although in the past infection has been a complication to be feared, under modern conditions this is no longer so important.

In the late postoperative period the common complications are opacification of the transplant and vascularization. For the former there is little to be done, but in the latter x-ray is very helpful. It has been my custom to use approximately 400 R in divided doses of 50 R each. Doses can be given about five days apart. Consoling to the surgeon is the fact that if opacification of the transplant occurs, a retransplant can always be done. It is necessary, however, that the new transplant exceed the old one in size.

GENERAL POSTOPERATIVE COURSE

It has been my practice to leave sutures in for at least ten days. Some have argued that the sutures might damage the new corneal epithelium, but I have not found this complication in any of my cases.

As has been noted in the motion picture it has been your speaker's custom to place an air bubble in the anterior chamber at the time of operation. This indicates clearly whether the transplant fits properly and acts as a cushion for pressure changes, and this should help to avoid the complication of iris incarceration.

Your speaker generally sends his patients home in two weeks and they wear a pressure bandage for about a week longer; and are under atropinization for approximately a month.

COMMENT

It is necessary that the technique of corneal transplantation in cases with conical cornea be particularly scrupulous, inasmuch as the cornea is so thin. Such thinness adds very considerably to the difficulties of cutting the cornea accurately. When the marking knife is used the cornea has a tendency to buckle and when the scissors are used a clean cut is difficult to make. In the operation done for corneal leucoma in which the cornea is of normal or greater than normal thickness, the procedure is relatively easy. Furthermore, in the conical cornea cases a large transplant is necessary in order that

it may act as a support for the remaining portion of the cornea. The contrary is true in the corneal leucoma cases in which the cornea itself acts as a support for the transplant.

Following transplantation the question of the amount of astigmatism produced arises. In general, astigmatism is about of the same order as that found after cataract surgery, although in those cases that develop anterior synechiae the amount may be greater than normal, and at an odd axis.

It behooves ophthalmologists on the Pacific Coast to familiarize themselves with this type of procedure and to make use of it. There will probably be a great number of patients with corneal leucoma coming back from the armed services, who will require corneal transplantation. Too, there are those with conical cornea who have threatened rupture, or who are unable to wear contact lenses, who should be given the privilege of having this type of surgery.

SUMMARY

A colored motion picture was demonstrated to show the technique of corneal transplantation in keratoconus by the Castroviejo technique. A discussion of some of the complications was presented. Colleagues were urged to make the use of this type of surgery more widespread.

727 West Seventh Street.

DEAFNESS—A MODERN APPROACH TO ITS TREATMENT

W. D. CURRIER, M. D.

Pasadena

IT might be said that in no other field of medicine more pessimism and "defeatism" is to be encountered than that which exists with regard to the treatment of deafness. The following pronouncements are examples of authentic statements by so-called authorities in the field of otology:

"Nothing can be done for deafness."

"The patient has nerve deafness, so there is no treatment."

"Your child is congenitally deafened and there is nothing that can be done. When he will be 5 or 6 years old, institutionalize him in a school for the deafened."

"We do not operate because of deafness."

"I can arrive at a diagnosis of deafness and tell whether my patients are improving without an audiogram."

ERRONEOUS STATEMENTS MAKE FOR PESSIMISTIC APPROACH

Fortunately, not one of these statements is true. But the disturbing fact remains that physicians in general and otologists in particular are so easily prepared to accept defeat in the treatment of deafness. Not even in the care and treatment of cancer patients has a comparable attitude of pessimism been allowed to become established almost without a challenge. But while cancer is notably a disease of old age, usually found in persons who have passed the prime of their active life, deafness is most harmful in childhood and youth. Moreover, the number of persons suffering from deafness is much larger than the number of cancer patients. It would, therefore, be no more than a socially and economically logical procedure to institute the most comprehensive research for the study and treatment of deafness. There is a great need for a few heavily endowed institutions with the sole purpose of furthering the research and advancing the clinical treatment of deafness. Such research centers would undoubtedly attract the keenest minds in